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(54) Preparation for maintaining muscle and promoting muscle generation

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## DESCRIPTION

### **Preparation for maintaining muscle and promoting muscle generation**

The invention concerns a preparation for maintaining muscle and promoting muscle generation.

All proteins in the human body are constantly being subjected to generation and degeneration. In normal, healthy young adults and healthy humans, protein generation and degeneration are to a large extent in equilibrium, thus maintaining the body's store of protein. A person is in a state of protein catabolism if her protein generation falls behind her protein degeneration. This situation occurs in cases of great physical stress and nutrient deficiency, but also with increasing age or certain diseases. A person is in a state of protein anabolism when her protein generation is greater than her protein degeneration. This is the state aspired to not only by bodybuilders but also by people recovering from serious illnesses and of course children and adolescents.

By the middle of the human lifespan, the biological degeneration and aging process has already started. Among other things, after age 35 to 40 the muscle mass decreases by circa 1% each year, causing a decrease in physical performance capabilities.

Consequently, in order to build muscle or maintain it in old age, the anabolic processes must be maximized, or the catabolic processes must be minimized, or, better yet, both must occur simultaneously. Today we know that the minimization of degeneration processes is considerably more effective than the maximization of generation processes when attempting to achieve total body protein anabolism.

Supplements can be used to achieve this state of protein anabolism. Bodybuilders are familiar with numerous substances of this nature.

They include the BCAAs (branched chain amino acids) which the body requires for building muscle tissue and which thus have an anabolic function. These amino acids are primarily metabolized or consumed to produce energy during training. Among these amino acids, L-Leucine plays an important role. Consuming BCAAs prior to training primarily has an anticatabolic effect because the supplemented amino acids are "burned" instead of the body's available protein.

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Alpha ketoisocaproate (KIC) is a derivative of the amino acid L-Leucine, i.e. L-Leucine is converted by the body into KIC. KIC has beneficial properties similar to those of L-Leucine but it is much more expensive. Many scientific studies have proven that both L-Leucine and KIC, when consumed above and beyond the recommended daily minimum allowance, reduce muscle degeneration and increase protein synthesis. In other words, they have not only anticatabolic, but also genuinely anabolic effects. A quantity of ca. 15 to 60 g L-Leucine per day must be consumed to compensate for the L-Leucine lost during training and to permit the normal generative processes stimulated by the training to occur at all. This quantity of L-Leucine is so to speak the fundamental prerequisite that must be present for muscle generation to even occur.

BCAAs and KIC have two main disadvantages. On the one hand, the daily supplemental quantity of BCAAs ~~and~~ cannot be increased *ad infinitum* because we know that the consumption of excessively high quantities of L-Leucine creates an undesirable amino acid imbalance in the body that neutralizes and even negates the anticatabolic L-Leucine benefits. On the other hand, quite large quantities are required to achieve the desired goal. It is most commonly recommended to take 15 to 60 g BCAAs containing 40% L-Leucine prior to training, in addition to a nutritious diet containing high quantities of protein.

The object of this invention is to create a preparation for maintaining muscle and promoting muscle generation that results in better muscle maintenance and increases muscle generation in comparison to the known preparations.

The invention achieves this objective with a preparation for maintaining muscle and promoting muscle generation that contains a mixture consisting of at least one amino acid, one protein, one protein hydrolysate or one derivative of an amino acid and beta-hydroxy-beta methyl butyric acid (HMB) or salts thereof.

The invention's concept includes the possibility of a proportion of beta-hydroxy-beta methyl butyric acid (HMB) in the mixture of not less than 0.5% by weight.

The invention's plan is for the amino acid to be L-Leucine.

It is also beneficial if the amino acid's derivative is alpha ketoisocaproate (KIC).

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The invention's advantages are essentially that, surprisingly, the combination of an amino acid and an amino acid's degradation product results in significantly improved muscle maintenance and generation in comparison to the consumption of amino acid alone. Another advantage of the invention is that the above-mentioned necessary consumption quantity of proteins, protein hydrolysate, BCAAs or their derivatives can be reduced while still achieving equivalent or even better effects. The fact that only one preparation need be taken instead of two is a technical application advantage.

It is assumed that the anticatabolic effect is caused neither by the BCAAs nor by the L-Leucine derivative KIC, but rather by the beta-hydroxy-beta methyl butyric acid product formed from these substances. This beta-hydroxy-beta methyl butyric acid (HMB) is a short-chain fatty acid formed in the body from the dietary amino acid L-Leucine.

With an average diet, the body synthesizes around 3 g daily (around 5 g daily on a protein-rich sports diet). HMB is a nutrient that plays an important nutritional-physiological role in the protein generation and maintenance metabolisms. As is typical for such derivatives, HMB is also found only in small quantities in the human body because the body has scarcely any storage capabilities for HMB. Apparently, dietary consumption of an extra ca. 3 g of this derivative, in cases where there is no L-Leucine deficiency, has very good anabolic and anticatabolic results that cannot be achieved, even with extra consumption of very high quantities of L-Leucine or KIC [sic].

HMB cannot eliminate the necessity for consuming L-Leucine, however, because L-Leucine is an essential amino acid that the body cannot create itself except by breaking down body proteins.

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The combination of BCAAs, particularly of L-Leucine, with HMB, surprisingly, appears to reduce the L-Leucine requirement. Initial studies have shown that the nutritional-physiological effects of the combination of proteins, amino acids, and HMB are not only cumulative but also apparently potentiated to a certain extent, in other words synergistically reinforced, in an effect that appears to vary according to the amino acid composition of the product combined with HMB. Studies indicate that better complementary effects can be achieved when HMB is combined with certain protein hydrolysates and/or amino acid mixtures rather than with pure proteins.

Thus when a supplement of 3 g HMB is taken daily with a protein consumption of 200 g per day results can be achieved that are similar to a daily protein consumption of 400 g minus the administration of HMB. Remarkably, even a 0.5% HMB supplement enormously enhances the value of a nutritional protein or amino acid and significantly increases the protein efficiency.

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**PROTECTION CLAIMS**

1. Preparation for maintaining muscle and promoting muscle generation, characterized by the fact that it contains a mixture consisting of at least one amino acid, one protein, one protein hydrolysate or one derivative of an amino acid and beta-hydroxy-beta methyl butyric acid (HMB) or salts thereof.
2. Preparation in accordance with Claim 1, characterized by the fact that it includes a proportion of beta-hydroxy-beta methyl butyric acid (HMB) in the mixture of not less than 0.5% by weight.
3. Preparation in accordance with Claim 1, characterized by the fact that the amino acid is L-Leucine.
4. Preparation in accordance with Claim 1, characterized by the fact that the amino acid's derivative is alpha ketoisocaproate (KIC).

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